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How to Develop and Deliver an Audiological Internet-based Interventions

Background

Telehealth has been available for over two decades, although only a small percentage of healthcare professionals have incorporated telehealth practices. This is also true for hearing healthcare. The global pandemic due to COVID 19 virus has forced clinicians to consider ways of serving their existing patients with minimal face-to-face contact. This has resulted in an urgent need for education and training in the use of tele-audiological practices.

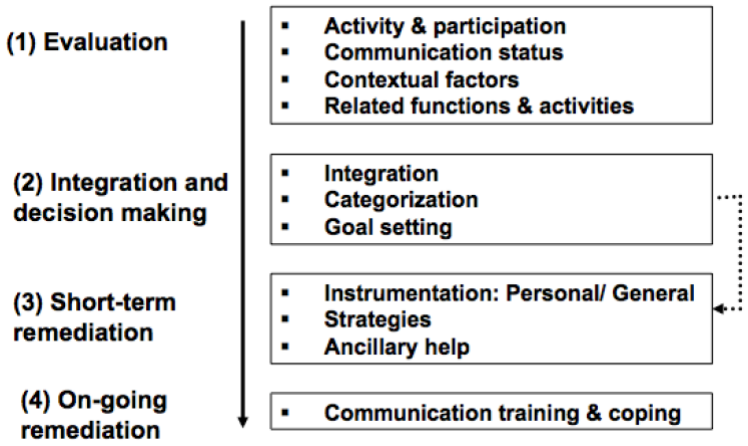
There is increasing evidence pertaining to Internet-based audiological interventions (Beukes et al., 2019; Beukes & Manchaiah, 2019). Overall, research has demonstrated that Internet-based interventions can be useful in improving the outcomes of people with hearing loss (Thorén et al., 2014; Malmberg et al., 2017), balance disorders (Geraghty et al., 2017; Pyykkő et al., 2017), and tinnitus (Beukes et al., 2018a, 2018b, 2018c). Various other tele-audiological practices exist including screening, diagnostic testing, remote hearing aid fittings and programming and cochlear implant support. However, there has been limited translation of knowledge from research to clinical practice for most of these practices.

Due to the importance of rehabilitation within audiology care, this paper is focused on rehabilitation processes using support from an Internet-based approach. This overview can provide a stepping stone to developing further appropriate tele-audiology tools. We believe that these strategies may be helpful for audiologists to improve access to and outcomes of hearing healthcare during the present situation and even after this crisis subsides (Torous et al., 2020).

Role of Internet-based Interventions in Audiological Rehabilitation

Management of chronic conditions involve various aspects including a comprehensive assessment, identifying appropriate medical management options and promoting self-management to reduce the wider consequences of the disorder. Various hearing and balance disorders are chronic in nature and require holistic approaches to address the wider consequences and achieve optimal outcomes. Figure 1 presents the audiological enablement/rehabilitation model proposed by Stephens and Kramer (2009), which include four stages: (1) evaluation, (2) integration and decision making, (3) short-term remediation, and (4) ongoing remediation. Patients should be managed holistically to incorporate all these stages. Initially, the hearing healthcare professionals should conduct a detailed assessment, suggest appropriate hearing or assistive devices if necessary. A structured rehabilitation program can follow with ongoing support if required. Such programs can focus on teaching positive coping strategies so that patients achieve optimal hearing healthcare outcomes. Such a model can be adapted to be offered face-to-face or using various tele-audiological strategies (Tao et al., 2018). This article will provide some suggestion for developing Internet-based tele-health support.

Figure 1: Audiological enablement/rehabilitation model proposed by Stephens and Kramer (2009)



Developing and Delivering Audiological Internet-based Interventions

Identifying the population and scope of intervention: The first step in the development of the population and the scope of the intervention. For instance, you may be dealing with adults with hearing loss who may require hearing tactics and communication strategies following their hearing aid fitting. Patients with tinnitus may benefit from sound enrichment strategies and psychological-based approaches such as mindfulness and cognitive behavioral therapy. If your practice focuses on balance disorder patients, the scope may be providing vestibular rehabilitation.

Developing a structured program: Rehabilitation can be offered using encrypted video chat technologies such as skype. These sessions can be complemented by a structured guided self-help program consisting of several sessions and running over a few weeks. A 4-week communication strategies program for hearing aid users, as shown in Table 1, could for instance be developed. The materials for this can come from various sources including your own clinical knowledge and experience, published rehabilitation manuals, and information from patient organizations (e.g., https://www.hearingloss.org/; https://vestibular.org/; https://www.ata.org/). Appropriate permissions must be sought before using copyrighted materials. It is important to ensure that the intervention materials are accessible to those with low literacy skills by writing the them in plain language and to ensuring the text is below the 6th reading grade level (Beukes et al., 2020; Kelly-Campbell & Manchaiah, 2020). Including graphs, images and videos to supplement the text information will enhance user experience. Moreover, adding some exercises can encourage user engagement and test their understanding of intervention components.

Table 1: Example of a rehabilitation program for adult hearing aid users

Timeline	**Program components**
Week 1	▪ Introduction to program ▪ Understanding hearing loss ▪ Basic of hearing aids
Week 2	▪ Communication strategies: Basics ▪ Communication strategies: Conversation at home ▪ Hearing aid handling and maintenance
Week 3	▪ Communication strategies: Conversation in background noise

	▪ Assistive listening devices
Week 4	▪ Applied relaxation ▪ How to maintain behavior change

Webpage creation and compliance: The weekly intervention components can be sent to users via email (e.g., PDF documents). However, if time and resource permit it would be useful to develop a webpage which can include specific pages of the intervention components. While the public page can be accessible by anyone, the website can include secure login and the intervention access can be provided to those who are enrolled into the program. The website can be hosted either in a local server or at the cloud server through a paid service. It is necessary to ensure HIPAA compliance if any patient data are stored within the website.

Assessment processes: Prior to offering the program, baseline assessment measures should be taken. Assessment measures can be created on a survey link to include relevant aspects depending on the disorder being addressed. The same outcome measures can be used to assess what benefits the users may have had from the intervention program. These outcomes can include both primary concerns (e.g. hearing disability, tinnitus distress, vestibular difficulties) and related consequences such as insomnia, anxiety, and depression.

Monitoring progress and outcomes: It is important to monitor the engagement and progress of the Internet intervention users to ensure optimal outcomes. The user engagement should be monitored weekly or fortnightly using short self-reported questionnaires (e.g., the Tinnitus Handicap Inventory Screening Version) and examining the completion of exercises within the modules. Individualized feedback on the user's activities should be provided. This could be via email or a video chat.

Licensing and reimbursement: There is no specific licensing requirements to offer Internet-based interventions within your specialty area as long as you are licensed to provide clinical services. However, the American Speech-Language and Hearing Association (ASHA) website provides up-to-date state-by-state information about the tele practice laws and regulations (https://www.asha.org/About/Telepractice-Resources-During-COVID-19/). In addition, hearing healthcare professionals need to consider the reimbursement aspects of providing Internet-based interventions before offering such services.

Final Thoughts

Internet-based interventions help improve access to care and improve outcomes of hearing healthcare services. Such interventions can be seen as supplementary or as replacement to existing care. While there is some cost and time associated with the development of an Internet-based intervention, it is easy to scale this so that it can be offered to large number of individuals at a minimal cost and less professional time per patient. We hope that audiologists see this crisis of minimal face-to-face contact with their patients as an opportunity to develop specialized interventions that can be offered remotely which will continue to serve their patients even after this crisis subsides.

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